REMARKS

Claims 1-40 were pending at the time of the Office action. Claims 37, 39 and 40 are amended to correct minor clerical errors. Claims 41-44 are newly added. No new matter is added. Accordingly, claims 1-44 are pending in the application.

Claim Rejections Under 35 U.S.C. 102 and 103

In paragraph 3 of the Office action, claims 1, 2, 4, 5 and 19-39 were rejected under 35 U.S.C. 102(b) as being anticipated by Kameoka et al. ("Kameoka," U.S. Patent No. 3,711,620).

The rejection of these claims is respectfully traversed.

As originally presented, independent claim 1 recites:

> A vocoder system comprising:
>
> formant detection means for detecting formant characteristics of a first musical tone signal;
>
> musical tone signal input means for inputting a second musical tone signal that corresponds to specified pitch information;
>
> division means for dividing the second musical tone signal into a plurality of frequency bands, the respective center frequencies of which have been fixed;
>
> setting means for setting modulation levels corresponding to each of the frequency bands based on the formant characteristics and formant control information with which the formant characteristics detected by the formant detection means are changed; and
>
> modulation means for modulating a level of a signal of each of the frequency bands based on the modulation level set in the setting means. (Emphasis added.)

Applicant is unable to find, in the cited portions of Kameoka, disclosure or suggestion of the noted features of claim 1.

First, Kameoka does not disclose or suggest a vocoder system. Rather, Kameoka is directed to a musical tone signal generator, the input of which is filtered white noise. (See Kameoka, FIG. 1 and Col. 2, lines 24-40.) As disclosed in Kameoka, fundamental tone signals are modulated by the white noise "to provide a musical tone generator producing the natural tone of the violin family[.]" (See Kameoka, Col. 1, lines 35-41.) As such, Applicant respectfully submits, at the outset, that Kameoka's musical tone signal generator is fundamentally distinguishable from a "vocoder system," as called for in claim 1.

In addition, the cited portion of Kameoka (i.e., Col. 2, lines 16-62) does not disclose or suggest "formant detection means for detecting formant characteristics of a first musical tone signal," as recited in claim 1. Rather, the cited portion discloses that the white noise input is filtered by band pass filters 8, 9. (See Kameoka, Col. 2, lines 30-40.) In more detail, Kameoka discloses:

> . . . The modulated signals for a vibrato effect are formed by mixing in a mixer 10 signal frequency signals from a vibrato signal oscillator 2 having a frequency of, for example, 6.3 Hz and first random noise signals obtained by passing output from a white noise signal generator 7 for generating noise signals having frequencies falling within a certain frequency band through a band pass filter 9 allowing the passage of signals having frequency components of, for example, 3 to 8 Hz. The present invention is further characterized in that there are supplied to the mixer 10 second random noise signals which were obtained by causing output from the white noise signal generator 7 to pass through a high pass or band pass filter or second filter 8 capable of passing through signals having frequency components of more than 50 Hz. (Col. 2, lines 24-40.) (Emphasis added.)

Applicant respectfully submits that the band pass filters 8, 9 of Kameoka do not disclose or suggest "formant detection means for detecting formant characteristics of a first musical tone signal," as recited in claim 1.

In addition, the cited portion of Kameoka (i.e., Col. 5, lines 5-55) does not disclose or suggest "setting means for setting modulation levels corresponding to each of the frequency bands based on the formant characteristics and formant control information with which the

formant characteristics detected by the formant detection means are changed," as recited in claim 1.

As previously explained, Kameoka does not disclose or suggest "formant detection means for detecting formant characteristics of a first musical tone signal." Therefore, Kameoka **cannot** disclose or suggest "setting means for setting modulation levels corresponding to each of the frequency bands based on the formant characteristics and formant control information with which the formant characteristics detected by the formant detection means are changed."

Further, Kameoka does not disclose or suggest "setting means for setting modulation levels corresponding to each of the frequency bands based on the formant characteristics . . ."

Rather, in reference to FIG. 8, Kameoka discloses only that burst signals from burst signal generators 38 can be modulated to different extents. (See Kameoka, FIG. 8 and Col. 5, lines 39-41.) However, this disclosure does not disclose or suggest "setting means for setting modulation levels corresponding to each of the frequency bands based on the formant characteristics . . ."

Further, Kameoka does not disclose or suggest "setting means for setting . . . formant control information with which the formant characteristics detected by the formant detection means are changed[.]"

Rather, in more detail, Kameoka discloses:

> Referring again to the embodiment of FIG. 1, where the fundamental tone signals alone are modulated, burst signals from the three burst signal generators are modulated in the same pattern and degree. In the embodiment of FIG. 8, however, burst signals from the three burst signal generator can be modulated to different extents. If there are further provided a plurality of modulation signal generating circuits, then it will be possible to modulate the burst signals in different patterns. With an actual string musical instrument of the violin family, harmonics of low and high orders often have their frequency periodically varied in different degrees, that is, at random. The embodiment of FIG. 8, therefore, is very convenient for simulation to such random frequency variations. Throughout the embodiments of the present invention, the same parts as those of FIG. 1 are

> denoted by the same numbers. In the embodiment of FIG. 8, the second random noise signals from the high pass filter 8 may be conducted to the mixer 10 as well as the burst signal generators 38. (Col. 5, lines 35-55.) (Emphasis added.)

As such, Kameoka teaches feeding the burst signal generators 38 with outputs from both the mixer 10 and the second band pass filter 8. (See Kameoka, FIG. 8.) Here, Kameoka teaches that the burst signals from the three burst signal generators can be modulated to different extents. Kameoka distinguishes the embodiment of FIG. 8 from that of FIG. 1, where "burst signals from the three burst signal generators are modulated in the same pattern and degree." (See Kameoka, Col. 5, lines 35-38.) There, the burst signal generators 11-1, 11-2, 11-3 are connected only to the mixer 10 via the tone generator and modulator 1. (See Kameoka, FIG. 1.)

Although Kameoka teaches that burst signals can be modulated to different extents, Applicant respectfully submits that this teaching does not disclose or suggest certain features of claim 1. In more detail, this teaching does not disclose or suggest "setting means for setting modulation levels corresponding to each of the frequency bands based on the formant characteristics **and** formant control information with which the formant characteristics detected by the formant detection means are changed," as recited in claim 1.

Furthermore, the cited portion of Kameoka (i.e., Col. 3, lines 46-58) does not disclose or suggest "modulation means for modulating a level of a signal of each of the frequency bands based on the modulation level set in the setting means[,]" as recited in claim 1.

As previously explained, Kameoka does not disclose or suggest "setting means for setting modulation levels corresponding to each of the frequency bands based on the formant characteristics . . ." Therefore, Kameoka **cannot** disclose or suggest "modulation means for modulating a level of a signal of each of the frequency bands based on the modulation level set in the setting means."

At least for the reasons presented above, Applicant respectfully submits that independent claim 1 is not anticipated by Kameoka.

At least because claims 2, 4, 5 and 19-36 depend from claim 1, Applicant respectfully submits that these dependent claims are not anticipated by Kameoka.

As amended, independent claim 37 recites:

> A method for generating a musical signal comprising:
>
> detecting formant characteristics of a first musical tone signal;
>
> inputting a second musical tone signal that corresponds to specified pitch information;
>
> dividing the second musical tone signal into a plurality of frequency bands, the respective center frequencies of which have been fixed;
>
> setting modulation levels corresponding to each of the frequency bands based on the formant characteristics **and** formant control information with which the formant characteristics detected by the formant detection means are changed; and
>
> modulating a level of a signal of each of the frequency bands based on the modulation level. (Emphasis added.)

At least for reasons similar to those presented with respect to independent claim 1, Applicant respectfully submits that independent claim 37 is not anticipated by Kameoka.

As originally presented, independent claim 38 recites:

> A vocoder system comprising:
>
> a formant detector for detecting formant characteristics of a first musical tone signal;
>
> an input device for inputting a second musical tone signal that corresponds to specified pitch information;
>
> a divider connected to the input device for dividing the second musical tone signal into a plurality of frequency bands, the respective center frequencies of which have been fixed;

a level setter for setting modulation levels corresponding to each of the frequency bands based on the formant characteristics **and** formant control information with which the formant characteristics detected by the formant detection means are changed; and

a modulator for modulating a level of a signal of each of the frequency bands based on the modulation level set in the level setter. (Emphasis added.)

At least for reasons similar to those presented with respect to independent claim 1, Applicant respectfully submits that independent claim 38 is not anticipated by Kameoka.

At least because claim 39 depends from claim 38, Applicant respectfully submits that this dependent claim is not anticipated by Kameoka.

Claim Rejections Under 35 U.S.C. 103

In paragraph 5 of the Office action, claims 3, 6-9 and 40 were rejected under 35 U.S.C. 103(a) as being unpatentable over Kameoka and further in view of well-known prior art.

In paragraph 6 of the Office action, claims 10-18 were rejected under 35 U.S.C. 103(a) as being unpatentable over Kameoka and further in view of Suzuki et al. ("Suzuki," U.S. Patent No. 5,691,496).

The rejections of the above claims are respectfully traversed.

Claims 3 and 6-9 depend from claim 1, and claim 40 depends from claim 38. As previously explained, claims 1 and 38 are not anticipated by Kameoka. It is not believed that well-known prior art supplies features of claim 1 and 38 explained to be missing from Kameoka. Therefore, Applicant respectfully submits that claims 3, 6-9 and 40 are not unpatentable over Kameoka and further in view of well-known prior art.

Claims 10-18 depend from claim 1. As previously explained, claim 1 is not anticipated by Kameoka. It is not believed that Suzuki supplies features of claim 1 explained to be missing from Kameoka.

Furthermore, Suzuki **teaches away** from "division means for dividing the second musical tone signal into a plurality of frequency bands, the respective center frequencies of which have been **fixed**," as recited in claim 1. Suzuki relates, in multiple aspects, to a frequency shift of a musical tone. (See Suzuki, Col. 1, lines 10-22.)

In more detail, Suzuki discloses:

> The present invention relates in one of its aspects to a musical tone control apparatus, particularly to an improvement of filter control of a musical tone, to a frequency shift of a musical tone, and to filter control, relates in another aspect to matching the gain by the filter control of a plurality of partial musical tone waveforms to be combined (synthesized), and relates in still another aspect to a frequency shift of a musical tone. Also, the present invention relates to a method of storing a musical tone waveform and a method of playing back a musical tone waveform, more particularly relates to a method of storage and a method of reproduction (playback) of a musical tone waveform using a frequency shift of a musical tone. (Col. 1, lines 10-22.) (Emphasis added.)

As such, Suzuki **teaches away** from the invention claimed in claim 1.

Furthermore, each of claims 10-18 recites: ". . . wherein the setting means sets the modulation levels by interpolation processing based on the formant characteristics and the formant control information."

Applicant respectfully submits that the cited portion of Suzuki (i.e., Col. 8, lines 6-32) does not disclose or suggest the noted features.

Rather, Suzuki discloses that musical tone waveform data is interpolated at certain sampling points of the waveform. (See Suzuki, Col. 8, lines 6-10.) As such, Suzuki does not disclose or suggest "wherein the setting means sets the **modulation levels** by interpolation processing . . ." as recited in each of claims 10-18.

Further, Suzuki does not disclose or suggest ". . . wherein the setting means sets the modulation levels by interpolation processing **based on the formant characteristics and the formant control information**."

Rather, Suzuki discloses that interpolation is performed by an interpolation circuit disclosed in other references. That is, Suzuki discloses:

> The musical tone waveform data TWj(t) read out from this musical tone waveform memory A05 in the time sharing manner is interpolated at the sampling points of the waveform by an interpolation circuit (not illustrated) and then sent to a band control filter A06. This interpolation circuit is the same as an interpolation circuit AB3 of FIG. 13 mentioned later. (Col. 8, lines 6-12.) (Emphasis added.)

Regarding the interpolation circuit AB3, Suzuki discloses:

> As the interpolation circuit AB3, it is also possible to use the apparatus shown in the specifications and drawings of Japanese Unexamined Patent Publication No. 51-8924 (Japanese Patent Application No. 49-80307), U.S. Pat. No. 4,111,090, U.S. Pat. No. 4,114,496, Japanese Unexamined Patent Publication No. 63-98699 (Japanese Patent Application No. 61-246310), U.S. Pat. No. 5,245,126, U.S. Pat. No. 5,117,725 and Japanese Unexamined Patent Publication No. 3-204696 (Japanese Patent Application No. 1-343476). It is deemed that all of the disclosed contents of these specifications and drawings are disclosed in the specification of the present application as they are.

It is not believed that any of the above references, as cited by Suzuki, teaches or suggests ". . . wherein the setting means sets the modulation levels by interpolation processing **based on the formant characteristics and the formant control information**," as recited in each of claims 10-18.

At least for the reasons explained, it is believed that claims 10-18 are patentable over Kameoka and further in view of Suzuki.

New Claims 41-44

New claims 41-44 depend from claim 1. At least for this reason, it is believed that these claims are patentable over the cited art.

Further, new claim 41 recites: ". . . wherein the first musical tone signal is produced by a male voice or a female voice." Support for this feature can be found, for example, in paragraph [0040] on page 8 of the present application.

New claim 42 recites: ". . . wherein the level of the signal of each of the frequency bands modulated by the modulation means is an amplitude of the signal." Support for this feature can be found, for example, in paragraph [0041] on page 8 of the present application.

New claim 43 recites: ". . . wherein, in the modulation means, the center frequencies of the frequency bands are maintained as fixed in the division means." Support for this feature can be found, for example, in paragraph [0059] on page 12 and in FIG. 7 of the present application.

New claim 44 recites: ". . . wherein the setting means sets the modulation levels by using a polynomial interpolation." Support for this feature can be found, for example, in paragraph [0052] on page 11 of the present application.

It is believed that each of the features noted above further distinguish the claimed invention over the cited art.

Concluding Remarks

Applicant believes that the present application is now in condition for allowance. Favorable reconsideration of the application as amended is respectfully requested.

The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by a check or credit card payment form being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 19-0741. If any extensions of time are needed for timely

acceptance of papers submitted herewith, Applicant hereby petitions for such extension under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 19-0741.

Respectfully submitted,

Date 12/6/07

By _____

FOLEY & LARDNER LLP
Customer Number: 23392
Telephone: (213) 972-4594
Facsimile: (213) 486-0065

Ted R. Rittmaster
Attorney for Applicant
Registration No. 32,933